GIET UNIVERSITY, GUNUPUR – 765022
M. B. A(First Semester) Examinations, April – 2021
MB103 - QUANTITATIVE TECHNIQUES

Time: 3hrs   Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A   **(2 x 10 = 20 Marks)**

Q.1. Answer *ALL* questions

  a. 10 is the mean of a set of 7 observations and 5 is the mean of a set of 3 observations. What is the mean of a combined set?

  b. An analysis of monthly wages paid to the workers of two firms A and B belonging to the same industry gives the following results:

	Firm A	Firm B
Number of workers	500	600
Average monthly wage	Rs. 186	Rs. 175
Variance of distribution of wages	81	100

  Interpret which firm A or B is there greater variability in individual wages?

  c. Define the correlation and give one example of correlation.

  d. State any two properties of regression coefficients.

  e. What is the feasible solution of Linear programming problem?

  f. Describe when the transportation problem is balanced.

  g. Define assignment problem.

  h. What are the categories of decision making?

  i. Solve the following game.

$$\text{Player – A} \begin{array}{c} \quad \text{Player – B} \\ \begin{pmatrix} 15 & 2 & 3 \\ 6 & 5 & 7 \\ -7 & 4 & 0 \end{pmatrix} \end{array}$$

  j. Explain Monte-Carlo Simulation.

PART – B   **(10 x 5 = 50 Marks)**

Answer *ANY FIVE* questions   Marks

2. a. Determine the mean, median of the distribution

Class	10-20	20-30	30-40	40-50	50-60
Frequency	7	15	18	25	30

5M

  b. Calculate the standard deviation for the following table giving the age distribution of 542 members.

Age in years	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. Of members	3	61	132	153	140	51	2

5M

3.a. Calculate the coefficient of correlation between X and Y from the following data:

x	1	2	3	4	5	6	7
y	2	4	5	3	8	6	7

5M

b. Given the bi-variate data obtain the Regression line of Y on X and hence predict Y if X =8

x	1	5	3	2	1	1	7	3
y	6	1	0	0	1	2	1	5

5M

4. Solve graphically the following LPP Maximize $Z = 5x_1 + 8x_2$, subject to constrains $15\,x_1 + 10\,x_2 \leq 180$, $10\,x_1 + 20\,x_2 \leq 200$, $15\,x_1 + 20\,x_2 \leq 210$ and $x_1, x_2 \geq 0$.

10M

5.a. Determine the initial feasible solution by using Vogel's approximation method.

Origin	D$_1$	D$_2$	D$_3$	D$_4$	Supply
			Destination		
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Demand	200	225	275	250	950

6M

b. Explain the procedure of North – West corner rule to find the initial basic feasible solution of transportation problem.

4M

6. The processing time in hours for the jobs when allocated to the different machines is indicated in below table. Assign the machines for the jobs so that the total processing time is minimum.

	M$_1$	M$_2$	M$_3$	M$_4$	M$_5$
J$_1$	9	22	58	11	19
J$_2$	43	78	72	50	63
J$_3$	41	28	91	37	45
J$_4$	74	42	27	49	39
J$_5$	36	11	57	22	25

10M

7. Two companies A and B are competing for the same product. Their different strategies are given in the following payoff matrix. Solve this game using dominance principal

10M

		Company B			
		B$_1$	B$_2$	B$_3$	B$_4$
Company A	A$_1$	3	2	4	0
	A$_2$	3	4	2	4
	A$_3$	4	2	4	0
	A$_4$	0	4	0	8

8. Customers arrive at service facility to get the required service. The inter arrivals and service times are constant and are 1.8 minutes and 4 minutes respectively. Simulate the system for 14 minutes. Determine the average waiting time of a customer and idle time of the service facility.

10M

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